Survey of Classroom Computers in Nova Scotia Schools

March 31, 2005

NOVA SCOTIA
Department of Education

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Executive Summary

The annual survey of school boards in Nova Scotia indicates a net increase of 5283 computers which are available for student use in public schools. Installations were increased significantly by a $2 million allocation late in 2004. This results in an overall ratio of students to current computers of 4.4:1 which is approximately at the median across Canada. 44% of classrooms have three or more computers. Several schools have supplemented classroom computers with mobile carts of wireless laptop computers which increase flexibility of usage within the school.

The overall ratio masks the variation in student to computer ratio particularly the 9.9:1 ratio in lower elementary grades. There continue to be inequities in access to computers in individual classrooms within schools, between older schools and recent construction projects and among school boards.

Excluding supervisors of technicians, school boards report a total of 80.8 technicians who are responsible for servicing nearly 38,000 classroom computers in addition to computers used for administrative purposes. That is more than 470 computers per technician compared to industry recommendations of 90 to 180 computers per technician.

Funding under the IEI_Extension continues to include professional development for teachers and technical support in addition to equipment and software.

Disclaimer: Quoting the numbers of computers in this survey, of course, does not represent the role these computers play in delivering the public school curriculum; numbers of units and the ratio of students to units are no measure of their effective application. The data simply indicates the extent to which computer resources are present in the learning environment, potentially to support learning.

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This report describes the installation of computers which are available for student learning in public schools across the province. Data is more detailed than in previous years and we thank school board staff for their cooperation and hard work.

Between April 2004 and March 2005, school boards report an addition to public school classrooms of approximately 5283 computers which are capable of running a current Internet browser. These additions came from the IEI-Extension (2384 new computers), school construction (620 new computers), the Technology Recycling Program (3774 refurbished computers) and school and school board purchases (2134 new computers). The largest increase occurred in grades 7 to 9 which is the current focus of the IEI-Extension.

At the same time, approximately 2655 older computers were withdrawn from the system. The net increase in computers in public school classrooms is 5283 computers or 19% over 2004.

Table: Change in Current Computers, 2004 to 2005

	P to 3	Gr 4-6	Gr 7-9	Gr 10-12	Labs	Total
Intel 2005	3237	6357	5756	7670	6057	29077
Mac 2005	698	1150	876	557	543	3824
Total 2005	**3935**	**7507**	**6632**	**8227**	**6600**	**32901**
Total 2004	3348	6729	4291	6598	6652	27618
Change	**587**	**778**	**2341**	**1629**	**-52**	**5283**
% Change	**17.53%**	**11.56%**	**54.56%**	**24.69%**	**-0.78%**	**19.13%**

Several schools have supplemented classroom computers with mobile carts of wireless laptop computers which increase flexibility of usage within the school.

Approximately 86% of total computers are Intel-based; 14% of total computers are Macintosh. The majority of Macintosh computers are in schools operated by the Chignecto Central Regional School Board (43%) and the Annapolis Valley Regional School Board (29%). The net proportion of Macintosh computers is affected by the output of the Technology Recycling Program which provides almost entirely Intel-based computers. New purchases through the IEI-Extension project were approximately 83% Intel-based and 17% Macintosh computers.

In 1996, the Nova Scotia Government set as a target for the year 2005, a ratio of

students to computers of 5:1. Counting all computers currently in use in public school classrooms in Nova Scotia, and considering a decline in overall student enrolment of 3118 (or approximately 2%), the overall ratio of students to total computers is now approximately 3.8:1. This is a significant accomplishment and compares favourably to the median ratio of computers to students across Canada of 5:1.[1]

However, as in other jurisdictions, that ratio is somewhat misleading because it includes approximately 5,000 computers which are more than eight years old and in need of replacement. The overall ratio also masks the variation in the ratio of computers to students at all grade levels which varies from 2.3:1 at high school to 7.7:1 at lower elementary (see Appendix, Table 4.3) Counting only computers capable of running a current Internet browser, the overall ratio is 4.4:1 and reflects a variation from 2.6:1 at high school to 9.9:1 at lower elementary (see Appendix, Table 4.2)

School Boards report that virtually 100% of computers capable of running a current Internet browser (software) are connected to the Internet. Schools are connected through the EDnet wide area network and share the Internet feed with community colleges, libraries and other users.

3136 or approximately 44% of learning spaces have three or more computers which are capable of running a current Internet browser. Excluding computer labs, this represents 36% of learning spaces in high school (grades 10 to 12) and 73% of learning spaces at grades 4 to 6, the focus of the IEI-Extension from 2002 to 2004. Only 23% of classrooms at primary to grade 3 have three or more current computers. The focus of the IEI-Extension in 2005 to 2007 is on grades 7 to 9.

It is significant that across all grade levels, approximately 4884 computers are reported as being less than a Pentium II or equivalent Macintosh computer (down from 6400 in 2004.) The normal service life of computers in a business setting is three years, while the service life for computers in schools can usually be stretched to five years. A Pentium II computer is more than seven years old; anything older than that is in need of immediate replacement.

Data in Table 4.2 (see Appendix) reveals inconsistent variation across school boards with CSAP reporting the best student to computer ratio (2.3:1) at junior high school and SRSB and TCRSB reporting the best student to computer ratio in high school (1.9:1 and 1.8:1 respectively.) (Note that SRSB reports grade 9 students with high school.) At grade 4 to 6, the previous focus of the IEI-Extension, the most attractive ratio is 2.6:1 in CSAP. At primary to grade 3, CSAP reports a ratio of 5.0:1 which is less than half the average across the province.

In 2003, a committee consisting of Department and school board staff recommended a minimum target ratio of students to computers at various grade levels ranging from approximately 2.5:1 at junior and senior high school, to approximately 8:1 at elementary. That would require an additional 914 computers at grades primary to 3 and 7600 new computers in grades 7 to 9.

Technical support and professional development for teachers are critical to the

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[1] *Connectivity and ICT Integration in Canadian elementary and secondary schools: First results from the Information and Communications Technologies in Schools Survey, 2003-2004*, Statistics Canada, P. 12

successful implementation of information technology in public school classrooms. School Boards report 80.8 FTE technicians, approximately 38% of which are funded under the IEI-Extension. This is approximately the same as reported in March 2004 and is a ratio overall of one technician per 476 computers with the best ratio in CCRSB (1:321) followed closely by SSRSB (1:387) and CSAP (1:392). Recommendations from independent industry advisors suggest ratios between 90 computers per technician and 180 computers per technician in addition to staff assigned to help desk, planning and training functions. Using the most conservative ratio, Nova Scotia schools require an additional 124 technicians to support computers in classroom use and more if one includes the computers designated for administrative use in schools and school boards.

Overall, the ratio of computers to students in public schools in Nova Scotia compares favourably with ratios in public schools across Canada, but work is needed to address the variation in access among individual classrooms, across grades and among schools.

Tables attached:

Table 1.1	Intel computers PII 266 or better ("Current Computer")
Table 1.2	Mac computers Power Mac 233 MHz or better ("Current Computer")
Table 1.3	Intel computers less than PII 266
Table 1.4	Mac computers less than Power Mac 233 MHz
Table 2.1	Classrooms with 3 or more "Current" Intel Computers
Table 2.2	Classrooms with 3 or more "Current" Mac Computers
Table 3.0	Total classrooms/learning spaces
Table 3.1	Classrooms with 3 or more current Intel or Mac computers
Table 3.2	Percentage of classrooms with 3 or more current Intel or Mac computers
Table 4.0	Audited school enrolments - September 30, 2004
Table 4.1	Total Intel + Mac computers
Table 4.2	Ratio of students to current computers
Table 4.3	Ratio of students to TOTAL computers
Table 4.4	Target ratio of students to computers
Table 5.0	School board technicians

Table 1.1 **Intel computers Pentium II 266 MHz or better ("Current Computer")**

Board	Computers p-3	Computers 4-6	Computers 7-9	Computers 10-12	Labs/Misc	Totals
AVRSB	349	498	452	1034	250	2583
CCRSB	335	484	571	1023	1333	3746
CBVRSB	361	820	953	688	1298	4120
CSAP	302	413	405	286		1406
HRSB	1368	3310	2610	3321	1022	11631
SRSB	278	376	470	673	1129	2926
SSRSB	71	138	119	277	349	954
TCRSB	173	318	176	368	676	1711
Totals	**3237**	**6357**	**5756**	**7670**	**6057**	**29077**

Note: In these tables, computers in labs in CSAP are reported within appropriate grade level; Grade 9 computers in SRSB are reported in grades 10-12.

Table 1.2 **Mac computers Power Mac 233 MHz or better ("Current Computer")**

Board	Computers p-3	Computers 4-6	Computers 7-9	Computers 10-12	Labs/Misc	Totals
AVRSB		285	291	233	70	1099
CCRSB	298	590	492	164		1544
CBVRSB	10	20	0	0	30	60
CSAP	0	0	0	34		34
HRSB	48	41	8	31	136	264
SRSB	6	4	5	9	18	42
SSRSB	220	175	77	44	181	572
TCRSB	21	35	3	42	108	209
Totals	**698**	**1150**	**876**	**557**	**543**	**3824**

Table 1.3 **Intel computers less than Pentium II 266 MHz**

Board	Computers P-3	Computers 4-6	Computers 7-9	Computers 10-12	Labs/Misc	Total
AVRSB	244	402	57	395	50	1148
CCRSB	139	71	121	79	250	660
CBVRSB	140	57	4	22	367	590
CSAP	48	34	29	16		127
HRSB	108	149	0	67	38	362
SRSB	0	0	2	0	6	8
SSRSB	32	15	17	57	116	237
TCRSB	41	27	7	14	200	289
Totals	**752**	**755**	**237**	**650**	**1027**	**3421**

Table 1.4 **Mac computers less than Power Mac 233 MHz**

Board	Computers P-3	Computers 4-6	Computers 7-9	Computers 10-12	Labs/Misc	Total
AVRSB	141	176	17	33	90	457
CCRSB	178	260	221	76		735
CBVRSB	6	6	0	0	26	38
CSAP	0	0	0	0		0
HRSB	0	0	0	0	0	0
SRSB	0	0	0	0	0	0
SSRSB	29	15	16	13	99	172
TCRSB	12	10	1	3	35	61
Totals	**366**	**467**	**255**	**125**	**250**	**1463**

Table 2.1 **Classrooms with 3 or more "Current" Intel computers**

Board	3 or More p-3	3 or More 4-6	3 or More 7-9	3 or More 10-12	Total
AVRSB	33	89	79	99	300
CCRSB	20	70	97	152	339
CBVRSB	59	195	105	163	522
CSAP	33	50	47	32	162
HRSB	140	480	262	105	987
SRSB	39	53	56	35	183
SSRSB	5	25	8	27	65
TCRSB	30	69	39	31	169
Overall	**359**	**1031**	**693**	**644**	**2727**

Table 2.2 **Classrooms with 3 or more "Current" Mac computers**

Board	3 or More p-3	3 or More 4-6	3 or More 7-9	3 or More 10-12	Total
AVRSB	10	13	48	14	85
CCRSB	38	93	68	24	223
CBVRSB	3	5	0	0	8
CSAP	0	0	0	3	3
HRSB	0	13	2	3	18
SRSB	0	0	2	2	4
SSRSB	11	27	10	6	54
TCRSB	1	6	0	7	14
Overall	**63**	**157**	**130**	**59**	**409**

Table 3.0 **Total classrooms/learning spaces**

Board	Grades P-3	Grades 4-6	Grades 7-9	Grades 10-12	Total
AVRSB	188	168	162	158	676
CCRSB	263	259	253	342	1117
CBVRSB	245	201	185	260	891
CSAP	92	84	68	60	304
HRSB	672	618	708	745	2743
SRSB	113	91	68	158	430
SSRSB	101	78	85	99	363
TCRSB	135	136	145	148	564
Overall	**1809**	**1635**	**1674**	**1970**	**7088**

Table 3.1 **Classrooms with 3 or more "current" Intel or Mac computers**

Board	3 or More p-3	3 or More 4-6	3 or More 7-9	3 or More 10-12	Total Rooms
AVRSB	43	102	127	113	385
CCRSB	58	163	165	176	562
CBVRSB	62	200	105	163	530
CSAP	33	50	47	35	165
HRSB	140	493	264	108	1005
SRSB	39	53	58	37	187
SSRSB	16	52	18	33	119
TCRSB	31	75	39	38	183
Overall	**422**	**1188**	**823**	**703**	**3136**

Table 3.2 **Percentage of classrooms with 3 or more "current" Intel or Mac computers**

Board	3 or More p-3	3 or More 4-6	3 or More 7-9	3 or More 10-12	Total
AVRSB	23%	61%	78%	72%	57%
CCRSB	22%	63%	65%	51%	50%
CBVRSB	25%	100%	57%	63%	59%
CSAP	36%	60%	69%	58%	54%
HRSB	21%	80%	37%	14%	37%
SRSB	35%	58%	85%	23%	43%
SSRSB	16%	67%	21%	33%	33%
TCRSB	23%	55%	27%	26%	32%
Overall	**23%**	**73%**	**49%**	**36%**	**44%**

Table 4.0 **Audited Public School Enrolments - September 30, 2004**

Board	p-3	4-6	7-9	10-12	Total Students
AVRSB	4,307	3,649	4,104	4,403	16,463
CCRSB	6,617	5,631	6,341	6,211	24,800
CBVRSB	4,516	4,121	4,708	5,123	18,468
CSAP	1,499	1,054	933	635	4,121
HRSB	15,289	12,464	13,867	13,957	55,577
SRSB	2,216	1,823	1,443	3,458	8,940
SSRSB	2,166	1,935	2,156	2,400	8,657
TCRSB	2,183	1,924	2,120	2,143	8,370
Totals	38,793	32,601	35,672	38,330	145,396

Table 4.1 **Total Intel + Mac computers**

Board	p-3	4-6	7-9	10-12	Labs/Misc	Totals
AVRSB	954	1361	817	2155	incl in Gr 10-12	5287
CCRSB	950	1405	1405	2925	incl in Gr 10-12	6685
CBVRSB	517	903	957	2431	incl in Gr 10-12	4808
CSAP	350	447	434	336	Incl in grade level	1567
HRSB	1524	3500	2618	4615	incl in Gr 10-12	12257
SRSB	284	380	477	1835	incl in Gr 10-12	2976
SSRSB	227	343	229	1136	incl in Gr 10-12	1935
TCRSB	247	390	187	1446	incl in Gr 10-12	2270
Overall	**5053**	**8729**	**7124**	**16879**		**37785**

Table 4.2 **Ratio of students to "current" computers**

Board	p-3	4-6	7-9	10-12	Overall
AVRSB	7.6	4.7	5.5	2.8	Labs incl in '10-12
CCRSB	10.5	5.2	6.0	2.5	Labs incl in '10-12
CBVRSB	12.2	4.9	4.9	2.5	Labs incl in '10-12
CSAP	5.0	2.6	2.3	2.0	Labs incl in grade level
HRSB	10.8	3.7	5.3	3.1	Labs incl in '10-12
SRSB	7.8	4.8	3.0	1.9	Labs incl in '10-12
SSRSB	13.0	6.2	11.0	2.8	Labs incl in '10-12
TCRSB	11.3	5.5	11.8	1.8	Labs incl in '10-12
Average	**9.9**	**4.3**	**5.4**	**2.6**	**4.4**

Table 4.3 **Ratio of students to TOTAL computers**

Board	p-3	4-6	7-9	10-12	Overall
AVRSB	4.5	2.7	5.0	2.0	Labs incl in '10-12
CCRSB	7.0	4.0	4.5	2.1	Labs incl in '10-12
CBVRSB	8.7	4.6	4.9	2.1	Labs incl in '10-12
CSAP	4.3	2.4	2.1	1.9	Labs incl in grade level
HRSB	10.0	3.6	5.3	3.0	Labs incl in '10-12
SRSB	7.8	4.8	3.0	1.9	Labs incl in '10-12
SSRSB	9.5	5.6	9.4	2.1	Labs incl in '10-12
TCRSB	8.8	4.9	11.3	1.5	Labs incl in '10-12
Average	**7.7**	**3.7**	**5.0**	**2.3**	**3.8**

Table 5.0 **School Board Technicians**

Board	IEI Technicians	Total Technicians	Notes	Computer per Tech
AVRSB	4.4	10	includes 1 help desk and 2 specialists; does not include the supervisor	528.7
CCRSB	4	20.8	includes wiring team & ARHS technician (not board employee)	321.4
CBVRSB	3.5	10.5		457.9
CSAP	1	4.5	0.5 techs for 3P; does not include supervisor	348.2
HRSB	12	19		645.1
SRSB	2	6		496.0
SSRSB	2	5	+ 1 tech supervisor, shared help desk & web dev with TCRSB	387.0
TCRSB	2.1	5	includes 0.9 3P technician	454.0
Overall	**31**	**80.8**		**467.6**